

North Carolina.—Charlotte, 4.00.

Ohio.—Ruggles, 2.00; North Lewisburg, 1.00; Jacksonburg, 1.00; Toledo, 0.50; Westerville, 0.50; Cleveland, trace; Columbus, trace; New Athens, trace.

Oregon.—Umatilla, trace.

Pennsylvania.—Grampian Hills, 8.00; Dyberry, 5.00; Wellsborough, 2.25; Erie, 2.00; Pittsburg, 0.50.

Texas.—Denison, 1.75; Coleman City, 1.25; Jacksborough, 1.00.

Utah.—Salt Lake City, trace.

Vermont.—Charlotte, 24.00; Newport, 20.00; Strafford, 18.00; Woodstock, 14.00.

Virginia.—Lynchburg, 4.00; Variety Mills, 4.00; Wytheville, 2.00; Accotink, trace.

Washington Territory.—Spokane Falls, 2.00.

Wisconsin.—Embarrass, 12.00; Ripon, 8.00; La Crosse, 3.50; Beloit, 2.00; Madison, 0.50; Milwaukee, 0.50.

Wyoming.—Fort Washakie, 3.50; Cheyenne, trace.

SNOW FROM A CLOUDLESS SKY.

Williamsport, Pennsylvania, 26th.—At 3.45 p. m., a heavy snow-storm began, which lasted until 4.30 p. m., after which light snow continued until 6.00 p. m., when the clouds suddenly disappeared, and it continued snowing from a cloudless sky for several minutes.

Huron, Dakota, 10th.—Snow fell from a cloudless sky from 7.00 to 9.00 a. m., presenting a beautiful appearance between the observer and the sun.

SLEET.

Fort Sully, Dakota, 18th.

Fort Totten, Dakota, 16th.

Fort Warren, Massachusetts, 23d.

Fort Assinniboine, Montana, 1st.

West Point, New York, 21st.

Morrison, Illinois, 19th, 20th.

Mattoon, Illinois, 9th.

Yates Centre, Kansas, 26th.

Charlestown, Massachusetts, 11th.

Freehold, New Jersey, 10th.

Vineland, New Jersey, 10th.

Bordentown, New Jersey, 10th.

Lenoir, North Carolina, 20th.

Blooming Grove, Pennsylvania, 21st.

West Chester, Pennsylvania, 10th.

Chambersburg, Pennsylvania, 9th.

Ripon, Wisconsin, 19th.

Portland, Maine, 23d.

New London, Connecticut, 21st.

Burlington, Vermont, 21st, 22d.

Washington, District of Columbia, 13th.

Norfolk, Virginia, 29th.

Albany, New York, 21st, 22d.

Atlantic City, New Jersey, 30th.

Atlanta, Georgia, 19th.

Sloop Point, North Carolina, 28th.

Louisville, Kentucky, 6th.

Columbus, Ohio, 9th.

Nashville, Tennessee, 28th.

Logansport, Indiana, 5th, 20th.

Cleveland, Ohio, 10th.

Toledo, Ohio, 5th, 20th, 27th.

Detroit, Michigan, 31st.

Rochester, New York, 20th.

Buffalo, New York, 10th.

Oswego, New York, 21st.

Mackinac City, Michigan, 19th, 20th.

Grand Haven, Michigan, 1st, 4th, 20th.

Milwaukee, Wisconsin, 2d.

Marquette, Michigan, 19th.

Escanaba, Michigan, 21st.

Chicago, Illinois, 19th, 23d.

Alpena, Michigan, 19th.

Tobacco Garden, Dakota, 3d, 23d.

Dubuque, Iowa, 4th, 19th.

Duluth, Minnesota, 20th.

Madison, Wisconsin, 19th.

Saint Paul, Minnesota, 20th.

Springfield, Illinois, 18th.

Cheyenne, Wyoming, 14th.

Fort McKavett, Texas, 31st.

WINDS.

The prevailing direction of the winds during the month of December, 1882, at Signal Service stations are shown on chart ii. by arrows flying with the wind. In the Southern states the prevailing winds are from the north; in the lower lake region, from the west and southwest; along the Atlantic coast and in the Upper Mississippi and Missouri valleys, they are mostly from the northwest; on the Pacific coast they are variable.

TOTAL MOVEMENTS OF THE AIR.

[In miles.]

The following are the largest total movements at the Signal Service stations: On the summit of Mount Washington, New Hampshire, 23,411; Cape May, New Jersey, 12,901; Pike's Peak, Colorado, 12,548; Hatteras, North Carolina, 12,279; Delaware Breakwater, Delaware, 11,809; Kittyhawk, North Carolina, 11,719; Barnegat, New Jersey, 10,573; Block Island, Rhode Island, 10,407; Rochester, New York, 10,087; Port Eads, Louisiana, 10,081; Indianola, Texas, 10,053; Buffalo, New York, 9,948; Galveston, Texas, 9,842; Erie, Pennsylvania, 9,749; Sandy Hook, New Jersey, 9,558; Sandusky, Ohio, 9,474; Fort Shaw, Montana, 9,459; Cape Henry, Virginia, 9,455; Mackinac City, Michigan, 9,397; Champaign, Illinois, 9,096; Milwaukee, Wisconsin, 8,946; Grand Haven, Michigan, 8,757; Oswego, New York, 8,732; Eastport, Maine, 8,545; Moorhead, Minnesota, 8,398; Provincetown, Massachusetts, 8,349; Fort Macon, North Carolina, 8,225; Cleveland, Ohio, 8,167; Newport, Rhode Island, 8,108; Fort Assinniboine, Montana, 8,011. The smallest total movements are: Visalia, California, 1,772; Silver City, New Mexico, 2,156; Fort Missoula, Montana, 2,255; Boise City, Idaho, 2,276; Lynchburg, Virginia, 2,284; Lewiston, Idaho, 2,395; Tucson, Arizona, 2,447; Dubuque, Iowa, 2,917.

HIGH WINDS.

Maximum velocities of fifty miles per hour or more have been reported as follows: On the summit of Mount Washington, New Hampshire, 69 nw., 1st; 54, nw., 2d; 72 nw., 3d; 70 sw., 4th; 84 w., 5th; 116 nw., 7th (maximum for month); 98 nw., 8th; 104 nw., 9th; 61 w., 10th; 83 e., 13th; 98 nw., 14th; 72 nw., 15th; 78 nw., 17th; 60 se., 22d; 66 e., 23d; 72 nw., 24th; 52 n., 28th; 68 nw., 29th; 68 nw., 30th; 96 nw., 30th.

On the summit of Pike's Peak, Colorado, 52 w., 1st; 64 nw., 3d; 72 nw., 4th; 62 w., 5th; 60 nw., 6th; 66 nw., 7th; 66 w., 8th; 54 w., 9th; 68 w., 10th; 86 w., 11th, (maximum for month).

Fort Sill, Indian Territory, 56 n., 7th.

Fort Stevenson, Dakota, 52 nw., 3d.

Indianola, Texas, 59 n., 7th.

Cape May, New Jersey, 62 nw., 7th.

Chincoteague, Virginia, 53 nw., 7th.

Kittyhawk, North Carolina, 66 ne., 30th.

Hatteras, North Carolina, 72 n., 30th.

Delaware Breakwater, Delaware, 52 nw., 3d; 57 n., 7th.

VERIFICATIONS.

INDICATIONS.

The detailed comparison of the tri-daily indications for December, 1882, with the telegraphic reports for the succeeding twenty-four hours, shows the general average percentage of verifications to be 87.56 per cent. The percentages for the four elements are: Weather, 89.40; direction of the wind, 83.23; temperature, 89.89; barometer, 87.70 per cent. By geographical districts, they are: For New England, 88.2; middle Atlantic states, 87.1; south Atlantic states, 88.1; eastern states, 86.5; western Gulf states, 88.8; lower lake region,

89.6; upper lake region, 89.5; Ohio valley and Tennessee, 87.9; upper Mississippi valley, 85.6; Missouri valley, 84.4; north Pacific coast region, 85.9; middle Pacific coast region, 85.7; south Pacific coast region, 96.1.

There were one hundred omissions to predict (twenty-three being due to the absence of reports from the Pacific coast,) out of 3,813, or 2.62 per cent. Of the 3,713 predictions that have been made, one hundred and fourteen, or 3.07 per cent., are considered to have entirely failed; one hundred and eighteen, or 3.18 per cent., were one-fourth verified; three hundred and twenty-nine, or 8.86 per cent., were one-half verified; three hundred and seventy-six, or 10.13 per cent., were three-fourths verified; 2,776, or 74.76 per cent., were verified, so far as can be ascertained from the tri-daily reports.

CAUTIONARY SIGNALS.

During December, 1882, one hundred and fifteen cautionary signals were displayed; of these, one hundred and one, or 87.83 per cent., were justified by winds of twenty-five miles per hour at or within one hundred miles of the station. Seventy-one cautionary off-shore signals were displayed; of these, sixty-six, or 92.96 per cent., were fully justified, both as to direction and velocity; three cautionary off-shore signals were justified as to velocity, but not as to direction. Four cautionary Northwest signals were ordered, all of which were justified as to direction, and one was justified as to direction and velocity. One hundred and ninety signals of all kinds were displayed, of which one hundred and sixty-eight, or 88.42 per cent., were fully justified. These do not include signals ordered at sixty-nine display stations, where the velocity is only estimated. Five signals were ordered late.

One hundred and sixty-six winds of twenty-five miles or more per hour were reported for which no signals were ordered; most of these were high local winds or strong sea-breezes.

NAVIGATION.

STAGE OF WATER IN RIVERS.

The highest and lowest stages of water observed at the Signal Service stations, during the month of December, 1882, are given in the table on the right-hand of chart iii. In the first column of this table are given the heights of water which have been found dangerous to property at the stations.

The Mississippi river was frozen as far south as Dubuque, Iowa, on the 8th, and remained closed during the remainder of the month. At Keokuk, Iowa, the river reached its highest point on the 31st, when it was within two feet and two inches of the danger-line. The lower Mississippi remained nearly stationary during the month, reaching its highest stage at Vicksburg, Mississippi on the 1st; at New Orleans, Louisiana, on the 5th, 6th, and 22d, and at Port Eads, Louisiana, on the 20th. At Saint Louis, Missouri, on the 18th, the river reached its lowest stage since November 29th, 1880, interrupting navigation, but rose on the 20th and 21st, when navigation was resumed. The Missouri river was highest at Leavenworth, Kansas, on the 19th; at Omaha, Nebraska, it was frozen from the 7th to the close of the month; and was frozen from the 2d to the close of the month at Yankton, Dakota. The Ohio river was highest at Cincinnati, Ohio, on the 29th, and at Louisville, Kentucky, on the 23d and 29th. At Pittsburgh, Pennsylvania, on the 11th, a special river report from New Geneva, Pennsylvania, was bulletined along the river front, stating a rise of five feet in the Monongahela river at that place. All vessels were loaded and prepared to depart as soon as the rise reached this point, and on the morning of the 12th, the river rose rapidly, permitting all of the boats to leave. The Cumberland river at Nashville, Tennessee, reached a height on the 3d and 4th sufficient to admit boats of heavy draught, and the winter steamboat season began on those dates. At Shreveport, Louisiana, on the 4th, work was suspended on the bridge across the Red River at that place on account of high water. On the 18th, the river fell rapidly, and on the 24th, work on the bridge was resumed. The Tennessee river at Chattanooga reached its lowest stage on the 9th and 10th, being unusually low for the season.

FLOODS.

Umatilla, Oregon, 14th.—Very heavy floods have occurred in the surrounding country. The town of Pendleton, Oregon, was flooded, and several buildings were carried away. Persons were compelled to climb trees to escape drowning. Several buildings on the Umatilla river were carried away, and wash-outs occurred along portions of the railroad, causing delay of trains. The damage done at Pendleton is estimated at \$250,000. On the 15th, the Willamette river rose three and one-half feet during twenty-four hours, reaching a higher point than ever known at this place.

Dayton, Washington Territory, 13th.—Touchet creek, which flows through this place, reached a higher point than it has touched for many years. No damage resulted in this vicinity other than the carrying away of fences and small bridges. Trains on the Oregon Railway and Navigation Company's railroad were discontinued owing to landslides, overflowed track, and damaged bridges. Nearly five inches of rain fell during the day, which is the heaviest rainfall of which there is any record at this place. The water in Touchet creek began falling at 5 a. m. of the 14th.

Lewiston, Idaho.—Very heavy rains fell during the 14th and 15th, the amount of rainfall being the largest ever known at this place. The Snake river rose about six feet and the Clearwater river rose four feet. Large quantities of drift were carried down the Snake river, making navigation dangerous. No damage resulted at this place.

Portland, Oregon.—Very heavy rain storm during the 12th and 13th. During the twenty-four hours ending at 8 p. m. of the 13th, 6.68 inches of rain fell. The storm ended during the night of the 13th. The river rose to seventeen feet and one inch above low-water mark, being a rise of ten feet and seven inches in forty-eight hours. Trains were delayed on the railroads on account of washing away of bridges, etc. The damage at this place was slight; a few small bridges were washed away and cellars filled with water. The rainfall during the storm was 12.83 inches.

HIGH TIDES.

Hatteras, North Carolina, 30th.

LOW TIDES.

New Haven, Connecticut, 8th.—The high westerly winds have caused remarkably low tides. Over the flats, where at high tide there is usually four feet of water, the ground is bare. Vessels are much inconvenienced by the low water.

ICE IN RIVERS AND HARBORS.

Mississippi river.—Saint Paul, Minnesota: floating ice in river on the 2d and 1th; river frozen from 7th to close of month. La Crosse, Wisconsin, floating ice, 2d, 3d; ferry boat "Warsaw" made last trip of season on 6th; river entirely frozen over on 8th.

Dubuque, Iowa.—Floating ice, 1st, 4th, 5th; ferry-boat forced down river a mile to effect landing on 6th; ferry-boat stopped running, and ice-dam above the railroad bridge on the 7th; river frozen over on 8th; teams crossing on ice, 11th; river rising, lifting ice and preventing teams from crossing on 21st; teams again crossing ice on 28th.

Davenport, Iowa.—Floating ice from 1st to 9th; ferry-boats stopped running, 6th; river closed at Le Claire, Iowa, on 7th; river frozen over, 10th; persons crossings on ice, 13th; teams crossing on ice, 15th; ice moving on rapids above the city, 21st. At 4.00 a. m. of the 22d, the ice in the river broke up below the bridge, crushing the platform of the Saint Louis and Saint Paul Packet Company's warehouse. The ferry-dock was broken from its moorings and carried one hundred yards down the river. The boat house belonging to the Davenport boat club was also damaged. Floating ice from 23d to 29th; teams crossing ice on the 30th and 31st.

Clinton, Iowa.—Floating ice, 3d; river frozen over, 7th.

Muscatine, Iowa.—River frozen over at Fairport, eight miles above this place on 7th; river frozen over at Muscatine, 24th.

Burlington, Iowa.—Floating ice, 3d; ferry-boats put into winter quarters, 6th; river frozen over, 15th.